CONDITIONING OF EXCHANGE TELEPHONE SERVICE LINES FOR USE IN DATA TRANSMISSION

A. GENERAL

A considerable difference exists between the transmission of voice messages and the transmission of data. The telecommunications network is designed primarily for voice transmission.

A certain amount of flexibility is inherent in voice communication because of the redundant nature of speech and the ability of the human mind to supply missing information to complete the message. In contrast, data transmission is more exacting in that it is a communication between electronic devices. These devices have a very low level of adaptability in comparison with a human. Further, the equipment is sensitive to imperfections that have little effect upon voice transmission.

A large variation can exist in the characteristics important to data transmission when connections are established over the telecommunications network. A connection may consist of from two switched links on a local connection to as many as 11 or 12 on a long distance call utilizing the entire DDD routing chain.

The number and variety of transmission facilities may vary from one call to another, ranging from metallic wire pairs, to carrier systems, to microwave radio or even via satellite. It is impossible to assure a uniform transmission path suitable for all types of data transmission even between the same terminating points as the number of links can vary on successive calls.

The condition is further complicated by the types of data sets that are connected at the terminal ends of the circuit. The data transmitting and receiving equipment may be either digital or analog and may be designed to transmit data at various speeds.

Data sets utilizing voice frequency facilities are classified into three categories according to the signalling rates used.

Data Set Types and Typical Examples

Type 1, 300 BPS and below	101, 103, 113, 401, 403, 407, 603
Type 2, 300 to 2400 BPS	201, 202, 402, 602
Type 3, 2400 to 4800 BPS	203, 208B

The data sets must be furnished by the customer in compliance with Part 68 of the F.C.C. Rules and Regulations. It is the responsibility of the customer to order facilities that are compatible with the type of data set to be utilized. (C)

The long distance telecommunications network, utilizing carrier or micro- wave equipment is engineered to more exacting tolerances and is normally suited to data transmission at speeds shown in the preceding table.

(C) Indicates Change

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A. GENERAL (Cont'd)

However, the local exchange telephone network, consisting primarily of two wire metallic circuits is normally not suitable for data transmission, except at very slow speeds without conditioning of the facility.

The Telephone Company will not assume any responsibility for special testing or for inordinate maintenance in connection with data transmission over exchange telephone lines that have not been suitably conditioned to be compatible with the type of Data Set connected thereto.

The rates and charges in B. following are for modification of each local exchange telephone facility to function within the following parameters necessary for data transmission.

Parameter	Data Set	
	Type I	Types II and III
Maximum Insertion Loss in dB 1000 Hz	9.0 dB *	9.0 dB *
Attenuation Distortion (Slope) 1000-2800 Hz	Not Specified **	3.0 dB Maximum
Impulse Noise Physical Facilities	Not Specified	No more than 15 counts in 15 minutes at a threshold of 50 dBrncO ***
Compandored Facilities Measured With - 13 dBmO Holding Tone	Not Specified	No more than 15 counts in 15 minutes at a threshold of 59 dBrncO ***
Message Circuit Noise-Meet Voice Objectives Using TTS-37B Noise Metallic	20 dBrnc or less	22 dBrnc or less
Envelope Delay Distortion 1000 to 2400 Hz	Not Specified	100 Microseconds Maximum
Transmitting Level at Serving Central Office	-12 dBm	-12 dBm

* Maximum loop plus Data Access Arrangement loss cannot exceed 11 dB.
** While no limit is specified, loop treatment is recommended if the slope exceeds 9 dB.
*** If voiceband weighting is used, increase all objectives by 1 dB.

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B. RATES

	Monthly	Installation #
Conditioning of local exchange telephone line for use with:		
Type I Data Sets	$3.00	$10.00
Type II or Type III Data Sets	8.00 (I)	20.00

Relocation of the data terminal requiring assignment of a different local exchange line, the installation charge will apply in addition to the Multi-part Nonrecurring charges in Section 3 applicable for relocation of the exchange telephone service.

In addition to NRC's in Section 3.

(I) Indicates Increase